



US Army Corps  
of Engineers  
Kansas City District

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**KANSAS CITY DISTRICT  
CORPS OF ENGINEERS  
and the  
GARDEN OF EDEN DRAINAGE DISTRICT – Section 3**

**Public Law 84-99 of the Flood Control Act of 1944  
Levee Rehabilitation – NEPA Review, Environmental  
Assessment & Finding of No Significant Impact**

**GARDEN OF EDEN DRAINAGE DISTRICT – SECTION 3,  
ITEM NO. 139S3, NON-FEDERAL,  
EMERGENCY LEVEE REHABILITATION PROJECT**

**Missouri River  
Chariton County, Missouri**

**March 2008**



DEPARTMENT OF THE ARMY  
KANSAS CITY DISTRICT, CORPS OF ENGINEERS  
700 FEDERAL BUILDING  
KANSAS CITY, MISSOURI 64106-2896

## **DRAFT**

### **Finding of No Significant Impact**

#### **Garden of Eden Drainage District – Section 3 (Item 139S3) Levee Rehabilitation Project Chariton County, Missouri**

#### **Project Summary**

The U.S. Army Corps of Engineers, Kansas City District (CENWK), in cooperation with the project sponsor, Garden of Eden Drainage District – Section 3, propose to construct the Garden of Eden Drainage District – Section 3 Levee Rehabilitation Project, under the authority of Public Law 84-99 of the Flood Control Act of 1944. Three alternatives were considered: (1) In-place repairs; (2) Landward levee setback and In-place repairs; and (3) No action. The Corps has identified Alternative 2 – Landward Levee Setback with In-place repairs as the recommended plan. The proposed project would involve repair of a severe breach with a landward levee setback, in-place repairs of a partial breach, repairs to intermittent crown, and landside and riverside erosion areas, along with re-seeding of both landside and riverside levee slopes to repair the agricultural levees damaged by the declared flood event of 6 May 2007. The proposed repairs are located in Chariton County, Missouri, near the town of Triplett, along the left descending bank of the Grand River between River Mile 15.0 and River Mile 7.0, and the right descending bank of Salt Creek.

#### **Alternatives**

Three alternatives were considered: (1) In-place repairs; (2) Landward levee setbacks with In-place repairs (**RECOMMENDED PLAN**); and (3) No action.

#### **Recommended Plan**

The recommended plan consists of repair to a severe levee breach (sta. 91+03 to 96+03), with an approximately 2,233-linear-feet-long landward levee setback; and in-place repairs of a partial breach (sta. 266+25 to 267+40); levee crown erosion repairs (sta. 258+00 to 261+00); landside slope erosion repairs (sta. 114+26 to 142+50 and 357+00 to 361+00); riverside erosion repairs (sta. 226+00 to 232+50); re-seeding of riverside levee slopes (sta. 114+26 to 142+50), and re-

seeding of both riverside and landside levee slopes (sta. 105+70 to 114+26 and 142+50 to 168+87).

## **Summary of Environmental Impacts**

The flood risk management level achieved by the recommended plan would be returned to the pre-flood condition. The recommended plan would result in no impacts to any properties listed, proposed for listing, eligible for listing, or potentially eligible for listing in the National Register of Historic Places. Approximately 40 trees including some mast producing trees and tree species that provide potential roost habitat for the Indiana bat would be removed to facilitate the landward levee setback. Approximately 2.5 acres of similar habitat was destroyed by the levee breach. More than 100 acres of similar habitat is located within the vicinity of the project area. The recommended plan will result in minor fill and vegetative impacts to mitigable resources as defined in USACE Planning regulations and under Section 404 of the Clean Water Act. These impacts are associated with minor excavation of sandy materials from farmed wetlands, minor excavation and fill in Natural Resource Conservation Service Wetland Reserve Program lands, and some trees removal. Areas of the existing levee sections damaged by flooding would be temporarily disturbed by the proposed construction activity.

The adverse effects associated with the proposed project are long-term/minor associated with loss of agricultural land and short term/minor associated with project construction. These minor adverse effects would be greatly offset by restoring the flood risk management capability, and its associated social and economic benefits of the existing levee system. Alternative 2, Landward levee setback with In-place repairs, meets the project purpose and need of rehabilitating the flood risk management capability, and its associated social and economic benefits of the existing levee system. Of the three (3) alternatives considered, Alternative 2 –Landward levee setback with in-place repairs is recommended because it has the highest cost/benefit ratio, provides benefits to the aquatic ecosystem, and is consistent with protection of the nation's environment.

## **Mitigation Measures**

The recommended plan will result in minor impacts to mitigable resources as defined in USACE Planning regulations and under Section 404 of the Clean Water Act. These impacts are associated with minor excavation of sandy material from within farmed wetland areas and minor excavation and fill from/in Natural Resource Conservation Service (NRCS) Wetland Reserve Program lands and an existing drainage ditch. General Permit Number NWKGP-41 authorizes these actions. In addition, the project sponsor will consult with the NRCS to obtain a Compatible Use Authorization agreement to ensure that borrow operations do not adversely impact the wetland or easement area.

A mixture of timber within both the WRP and drainage ditch areas, consisting of cottonwoods, willows, silver maple, sycamore, oak, and pecan; less than and greater than 9 inches breast diameter height, will be removed during project construction. CENWK has determined in coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Service that natural plant succession should provide adequate re-vegetation of non-mast producing trees. The removal of some hardwood species does not appreciably change the

character of available habitat including available Indian bat summer habitat within the vicinity of the project area, and a sufficient seed base and stand of hardwood trees is present adjacent to the disturbed area to allow natural regeneration of these species. Additionally, with the levee setback, approximately 11 acres of floodplain and newly created wetland habitat will be protected. Therefore, no mitigation measures are proposed.

## **Public Availability**

Prior to a decision on whether to prepare an Environmental Impact Statement, CENWK circulated a Notice of Availability (Notice) of the Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI), dated \_\_\_\_\_, 2008, with a thirty-day comment period ending on \_\_\_\_\_, 2008 to the public and resource agencies. The Notice was e-mailed to individuals/agencies/businesses listed on CENWK-Regulatory Branch's e-mail mailing list. The Notice informed these individuals that the EA and Draft FONSI were available on the CENWK webpage or that they could request a hard copy of the EA and Draft FONSI in order to provide comment.

Levee rehabilitation projects completed by the Corps under authority of Public Law 84-99 generally do not require the preparation of an Environmental Impact Statement. These projects typically result in long-term social and economic benefits and the adverse environmental effects are typically minor/long-term and minor/short-term construction related. Minor long-term impacts associated with these projects are typically well outweighed by the overall long-term social and economic benefits of these projects. As described above, the recommended plan is consistent with this assessment of typical levee rehabilitation projects completed by the Corps under authority of Public Law 84-99 of the Flood Control Act of 1944.

## **Conclusion**

After evaluating the anticipated environmental, economic, and social effects of the proposed activity, it is my determination that construction of the proposed Garden of Eden Drainage District - Section 3 Levee Rehabilitation Project does not constitute a major Federal action that would significantly affect the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

Date: \_\_\_\_\_

\_\_\_\_\_  
Roger A. Wilson, Jr.  
Colonel, Corps of Engineers  
District Commander



**DEPARTMENT OF THE ARMY**  
**KANSAS CITY DISTRICT, CORPS OF ENGINEERS**  
700 FEDERAL BUILDING  
KANSAS CITY, MISSOURI 64106-2896

**EXECUTIVE SUMMARY**

The U.S. Army Corps of Engineers, Kansas City District (CENWK), in cooperation with the project sponsor, Garden of Eden Drainage District – Section 3, propose to construct the Garden of Eden Drainage District – Section 3 Levee Rehabilitation Project, under the authority of Public Law 84-99 of the Flood Control Act of 1944. The proposed project would involve a landward levee setback to repair a major breach; in-place repairs of partial breaches, intermittent crown, and landside and riverside erosion areas; and re-seeding of both levee landside and riverside levee slopes to repair the agricultural levees damaged by the declared flood event of 6 May 2007.

The Garden of Eden Drainage District – Section 3 levee segment consists of approximately 43,300 linear feet of earthen flood control works (FCW) on the left descending bank of the Grand River between river mile 15.0 and 7.0, and the right descending bank of Salt Creek in Chariton County, near the town of Triplett, Missouri. The FCW protect approximately 3,500 acres of agricultural lands (3,000 acres in cropland), one residence, three barns, 10 grain bins, approximately eight miles of gravel surfaced roads, numerous unimproved farm to market roads, and approximately two miles of buried water lines. The recommended plan consists of repair to a severe levee breach (sta. 91+03 to 96+03), with an approximately 2,233-linear-foot-long landward levee setback; and in-place repairs of a partial breach (sta. 266+25 to 267+40); levee crown erosion repairs (sta. 258+00 to 261+00); landside slope erosion repairs (sta. 114+26 to 142+50 and 357+00 to 361+00); riverside erosion repairs (sta. 226+00 to 232+50); re-seeding of riverside levee slopes (sta. 114+26 to 142+50, and ), and re-seeding of both riverside and landside levee slopes (sta. 105+70 to 114+26 and 142+50 to 168+87).

Borrow will be obtained by removing sand and silt deposition down to the original ground contours on the adjacent landward agricultural lands; degrading the remaining existing levee segments riverward of the new levee setbacks; degrading of a riverward secondary levee down to original ground contours, excavating the perimeter of a scour feature and the interior and perimeter of farmed wetlands. Excavations would be limited to an approximate 24" depth. All of the designated borrow locations are positioned within previously "environmentally cleared" borrow locations assessed during the 1993 and 1995 repair actions.

The new landward levee setback will traverse through an existing drainage/borrow ditch, which has a narrow, linear fringe of trees >9" diameter breast height (dbh) along its slopes. Approximately 40 trees consisting of pecan, oak, silver maple and sycamore will require removal for the levee footprint. The levee setback will also traverse through Natural Resources Conservation Service (NRCS) Wetland Reserve Program (WRP) lands, which contain a sparse growth of cottonwood and willow <9" dbh along its side slopes. All impacts to WRP lands will be coordinated with the NRCS. The project sponsor will consult with the NRCS to obtain a Compatible Use Authorization agreement to ensure that borrow operations are conducted accordingly and that excavation and fill does not adversely impact the wetland or easement area.

Identification of borrow sites was completed in accordance with the Standard Operating Procedures (SOP) for the Selection of Borrow Sites Missouri River and Tributaries 1995 Levee Repair. These guidelines were developed through coordination with the U.S. Fish and Wildlife Service and the Missouri Department of Conservation. CENWK has determined in coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Service that natural plant succession should provide adequate re-vegetation of non mast producing trees. The removal of some hardwood trees does not appreciably change the character of available habitat including potential Indiana bat roost habitat within the vicinity of the project area, and a sufficient seed base and stand of hardwood trees is present adjacent to the disturbed area to allow natural regeneration of these species. Benefits to the aquatic ecosystem include wetland enhancement and the return of 11 acres of agricultural land to the floodplain to develop into wetland and/or riparian habitat. Therefore, no mitigation is proposed.

Prior to a decision on whether to prepare an Environmental Impact Statement, CENWK circulated a Notice of Availability (Notice) of the Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI), dated \_\_\_\_\_, 2008, with a thirty-day comment period ending on \_\_\_\_\_, 2008 to the public and resource agencies. The Notice was e-mailed to individuals/agencies/businesses listed on CENWK-Regulatory Branch's e-mail mailing list. The Notice informed these individuals that the EA and Draft FONSI were available on the CENWK webpage or that they could request the EA and Draft FONSI in writing, in order to provide comment.

Additional information concerning this project may be obtained from Mr. Richard A. Skinker, Environmental Resources Specialist, PM-PR, Kansas City District - U.S. Army Corps of Engineers, by writing the above address, or by telephone at 816-389-3134.

**NEPA REVIEW  
ENVIRONMENTAL ASSESSMENT  
&  
DRAFT FINDING OF NO SIGNIFICANT IMPACT**

**PUBLIC LAW 84-99  
GARDEN OF EDEN DRAINAGE DISTRICT  
SECTION 3  
LEVEE REHABILITATION PROJECT  
CHARITON COUNTY, MISSOURI**

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**PUBLIC LAW 84-99  
GARDEN OF EDEN DRAINAGE DISTRICT  
SECTION 3  
LEVEE REHABILITATION PROJECT  
CHARITON COUNTY, MISSOURI**

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**Section 1: INTRODUCTION**

This Environmental Assessment provides information that was developed during the National Environmental Policy Act (NEPA) public interest review of the proposed Public Law 84-99 Garden of Eden Drainage District – Section 3 Levee Rehabilitation Project.

**Section 2: AUTHORITY**

The Kansas City District – U.S. Army Corps of Engineers (CENWK), in cooperation with the project sponsor, the Garden of Eden Drainage District – Section 3, propose to construct the Garden of Eden Drainage District – Section 3 Levee Rehabilitation Project under the authority of Public Law 84-99 of the Flood Control Act of 1944.

**Section 3: PROJECT LOCATION**

The Garden of Eden Drainage District – Section 3 levee consists of approximately 43,300 linear feet of earthen flood control works (FCW) and is located in Chariton County, near the town of Triplett, Missouri, along the left descending bank of the Grand River between river mile 15.0 and 7.0, and the right descending bank of Salt Creek (See ATT B-1).

**Section 4: EXISTING CONDITION**

The declared flood event on 6 May 2007 caused damages to the Garden of Eden Drainage District – Section 3 flood control works. These damages consist of one severe levee breach at station 91+03 to 96+03; a partial levee breach at station 266+25 to 267+40; levee crown erosion at station 258+00 to 261+00; landside slope erosion at stations 114+26 to 142+50 and 357+00 to 361+00; riverside slope erosion at station 226+00 to 232+50; lost (destroyed) sod cover at riverside slope station 105+70 to 168+87; and lost (destroyed) sod cover at landside slope stations 105+70 to 114+26 and 142+50 to 168+87 (See ATT D-1).

## **Section 5: PURPOSE & NEED FOR ACTION**

The project purpose and need is to rehabilitate the damaged levees and restore the associated social and economic benefits. The Garden of Eden Drainage District – Section 3 received damages to sections of their levees during the 6 May 2007 declared flood event. Prior to the May 2007 event, the Garden of Eden Drainage District – Section 3 levee provided an approximately 10-year level of flood risk management. In its current damaged state, the Garden of Eden Drainage District – Section 3 levee is estimated to provide an approximately two-year level of protection. The existing condition exposes all public and private infrastructure and agricultural croplands to a high level of risk from future flooding. Failure to restore the flood risk management capability of the levee system would keep area residents livelihood and social well-being in turmoil, subject to the continuous threat of flooding until a level of flood protection is restored. Failure to reconstruct the levee could adversely affect the tax base of the county and municipal government. In addition, loss of jobs and potential losses in agricultural production on lands previously protected by the levee would also be incurred.

## **Section 6: ALTERNATIVES CONSIDERED BUT NOT SELECTED**

Two alternatives were considered, but not selected as the recommended plan. One build alternative (Alternative 1 – In-Place Repairs) and the No Action Alternative (Alternative 3).

STATIONS 91+03 to 96+03; SEVERE LEVEE BREACH: In-place repairs were considered in this repair action. The landward levee setback was determined through the Corps' economic analysis to be the most economical and prudent repair action.

STATIONS 105+70 to 168+87, 226+00 to 232+50, 258+00 to 261+00, 266+25 to 267+40, and 357+00 to 361+00 PARTIAL LEVEE BREACH; LANDSIDE, RIVERSIDE, AND CROWN EROSIONS; AND PARTIAL RE-SEEDING OF LANDSIDE AND RIVERSIDE SLOPES: Due to the limited nature of damage at these locations, in-place repairs were considered to be the most economic and prudent repair actions. In addition, allowance of re-vegetation to occur naturally was considered for lost (destroyed) sod cover.

The "No Action" Alternative would involve no construction and the levee would remain in its damaged condition. The No Action alternative would continue to expose public and private infrastructure and agricultural croplands to a high risk level of future flooding.

## **Section 7: RECOMMENDED PLAN**

The recommended plan consists of repair to a severe levee breach (sta. 91+03 to 96+03), with an approximately 2,233-linear-feet-long landward levee setback (See ATT D-2 and ATT E-3); and in-place repairs of a partial breach (sta. 266+25 to 267+40); levee crown erosion repairs (sta. 258+00 to 261+00); landside slope erosion repairs (sta. 114+26 to 142+50 and 357+00 to 361+00); riverside erosion repairs (sta. 226+00 to 232+50); re-seeding of riverside levee slopes (sta. 114+26 to 142+50), and re-seeding of both riverside and landside levee slopes (sta. 105+70 to 114+26 and 142+50 to 168+87). Borrow material will be obtained for repairs as described below (See Borrow Maps 1 and 2):

Station 83+15 to 105+70: Borrow will be obtained by removing sand deposition materials down to the original ground contours on the adjacent landward agricultural lands; degrading the remaining existing levee segments riverward of the new levee setbacks; degrading of a riverward secondary levee down to original ground contours, and enlarging a present scour feature by sloping perimeter scour face edge. The new landward levee setback will traverse through an existing drainage/borrow ditch, which will require the removal of approximately 40 trees >9 inches diameter breast height (dbh), some mast-producing (pecan and oak), and will also traverse through a NRCS WRP site, which also will require the removal of small woody vegetation consisting of cottonwoods and willows <9 inches dbh .

Station 226+00 to 232+50: Borrow will be obtained from agricultural lands located riverward of the existing levee by shallow excavations.

Station 258+00 to 261+00 and 266+25 to 267+40: Borrow will be obtained from landward agricultural lands adjacent to the repair area.

Station 357+00 to 361+00: Borrow will be obtained from along an existing drainage ditch slope within agricultural lands.

Station 114+26 to 142+50: Borrow material may or may not be required at this location. If borrow is needed, it will be obtained from adjoining landside berm slopes.

All of the above designated borrow locations are positioned within previously "environmentally cleared" borrow locations assessed during the 1993 and 1995 repair actions, with the exception of station 83+15 to 105+70 where the large timber will be impacted. The project sponsor will consult with the NRCS to obtain a Compatible Use Authorization agreement to ensure that borrow operations are conducted accordingly and that excavation and fill does not adversely impact the wetland or easement area.

## **Section 8: NATIONAL ENVIRONMENTAL POLICY ACT REVIEW**

As part of the NEPA review for the proposed project, CENWK circulated a Notice of Availability (Notice) of the Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI), dated \_\_\_\_\_, 2008, with a thirty-day comment period ending on \_\_\_\_\_, 2008 to the public and resource agencies. The Notice was e-mailed to individuals/agencies/businesses listed on CENWK-Regulatory Branch's e-mail mailing list. The Notice informed these individuals that the EA and Draft FONSI were available on the CENWK webpage or that they could request the EA and Draft FONSI in writing, in order to provide comment. The following comments were received and evaluated from coordination of the Notice:

(Section pending comments)

## **Section 9: AFFECTED ENVIRONMEMENT**

A wide variety of resources along with the related environmental, economic and social effects were considered during the development and evaluation of project alternatives. These include: atmospheric quality; noise levels; water quality; water supply; soil control; fish and wildlife; threatened and endangered species; vegetation; energy resources; wetlands; geological resources; agricultural activity; employment; tax base; public service; growth patterns; land use; recreation; archaeological and historical resources; flood risk management; esthetics; transportation; health and safety; community service; population density and other items identified through public and agency comments.

The project area consists of agricultural row crop ground and Wetland Reserve Program ground located on the Grand River flood plain between river miles 15.0 and 7.0. The project area disturbance involves approximately 40 acres or less (including borrow locations). The Corps Kansas City District's Standard Operating Procedures for identification and removal of potential borrow sites and material, which was developed in consultation with the resource agencies to avoid/and or minimize adverse environmental effects, would be implemented for this project.

## **Section 10: ENVIRONMENTAL CONSEQUENCES:**

Primary resources of concern identified during the evaluation included: noise levels, water quality, wetlands, vegetation, fish and wildlife, threatened and endangered species, geologic resources, agricultural activity, archeological and historical resources, floodplain and flood risk management, economics and esthetics. Project impacts to other resources were determined to be no effect.

### **Noise**

The recommended plan, Alternative 2, would result in minor short term construction related noise impacts. These impacts are the result of the operation of heavy machinery during project construction. These noise levels would be in addition, but similar to, those produced by agricultural equipment which is routinely operated in the project area. No residences, businesses, churches, park areas or other areas sensitive to increased noise levels were identified in the project area. There is a remote chance that the noise from project construction could disturb the occasional boater on the nearby Grand River or person(s) participating in outdoor recreation on the private land in the project area.

Alternative 1 – Repairs resulting from implementation of this alternative plan would result in noise impacts similar to those described above.

Alternative-3 – The “No Action” alternative would produce no increase in noise levels in the project area.

### **Water quality**

The recommended plan, Alternative 2, could result in minor, temporary, construction related adverse impacts to water quality resulting from site runoff and increased turbidity. Potential minor impacts associated with the recommended plan would be avoided and/or minimized to the

greatest extent possible by the implementation of Best Management Practices and measures required under the National Pollutant Discharge Elimination System (NPDES) permit. Best management practices would minimize the incidental fallback of material into the river during construction and would minimize the introduction of fuel, petroleum products, or other deleterious material from entering into the waterway. Such measures could include use of erosion control fences; storing equipment, solid waste, and petroleum products above the ordinary high water mark and away from areas prone to runoff; and requiring that all equipment be clean and free of leaks. To prevent fill from reaching water sources by wind or runoff, fill would be covered, stabilized or mulched, and silt fences would be used as required. The NPDES permit will be obtained prior to project construction. All appropriate measures will be taken to minimize erosion and storm water discharges during and after construction.

Alternative 1 – Repairs resulting from implementation of this alternative plan could result in minor, temporary, construction related adverse impacts to water quality similar to those describe above. As with the Recommended Alternative, potential impacts would be avoided and/or minimized to the greatest extent possible by the implementation of Best Management Practices and measures required under the National Pollutant Discharge Elimination System permit.

Alternative 3 – In the “No Action” Alternative with the absence of the Federal action addressing levee improvements, a high water event could result in the release of a variety of industrial chemicals and substantially impact the natural and human environment within the project area. Avoiding repair actions could result in adverse impacts to water quality from increased levels of nutrient loading and wastes, including runoff of pollutants from industrial sources, petroleum products, and non-point sources of human and animal wastes.

### **Wetlands**

The recommended plan will have minor temporary impacts on wetlands. These impacts are construction related and associated with the minor excavation of sandy material and sediment from within farmed wetland areas, minor excavation and fill from/in Natural Resource Conservation Service (NRCS) Wetland Reserve Program lands, and minor fill to an existing drainage ditch landward of the existing levee to facilitate construction of the levee setback (See Borrow Maps 1 and 2). A total of approximately 16 acres of wetland habitat will be temporarily impacted. General Permit Number NWKGP-41 authorizes these actions. The project sponsor will consult with the NRCS to obtain a Compatible Use Authorization agreement which states that excavation and fill can not adversely impact the wetland or easement area, and to obtain guidelines on acceptable borrow practices.

After project construction, the recommended plan will result in long-term benefits to wetlands. These benefits will result from borrow operations and through levee setbacks. Borrow operations will increase the depth and enlarge the surface area of existing farmed wetlands and the newly created blew hole by sloping their perimeter faces. This will enhance approximately 16 acres of farmed wetlands within the area of impact that have become degraded due to the deposition of silt as a result of adjacent agricultural runoff. The levee setback will maintain the blew hole, providing it the opportunity to create wetland features, and return approximately 11 acres of land to the river floodplain, which provides increased surface area for floodwater conveyance and wildlife habitat.

Alternative 1 – Repairs resulting from implementation of this alternative plan would place the levee on its original alignment through filling of the blew hole. This alternative would avoid placing borrow in WRP lands and the existing drainage ditch. The borrow operations would still be required and would increase on-site wetland area as described above. However, filling the blew hole would remove the opportunity for this area to mature into a functioning wetland, and without a setback, eleven acres would not be returned to the river floodplain.

Alternative 3 – The “No Action” Alternative could result in benefits to wetlands located behind the breeched levees as these areas would be subject to a new level of future flooding.

### **Vegetation**

The recommended plan, Alternative 2, would result in some borrow taken from NRCS WRP lands and farmed wetlands, and degrading along the secondary levee, which impacts some sparse opportunistic vegetation consisting of willows and cottonwoods < 9 inches dbh. The levee setback impacts a linear fringe of mature trees adjacent to a ditch located just landward of the existing levee. Approximately 40 large trees > 9 inches dbh consisting of silver maple, oak, pecan, and sycamore would be impacted as well as some smaller cottonwoods and willows < 9” dbh from levee setback construction. This strip of trees measures a contiguous distance of about 0.6 miles and cannot be avoided by a practical levee setback alignment. Approximately 11 acres of agricultural land will be removed from production due to the levee setback, but this acreage will be located riverward of the new levee in the floodplain and will revegetate naturally and

Alternative 1 – Repairs resulting from implementation of this alternative plan would result in less impacts to vegetation as a smaller amount of borrow would be required to facilitate in-place repairs and therefore require less disturbance.

Alternative 3 – The “No Action” Alternative could result in increases to the floodplain and to floodplain vegetation if levees are not repaired and lands are abandoned from farming due to the high risk of flooding. Over time, successional vegetative growth could result in increased acreages of floodplain forest.

### **Fish and Wildlife**

The recommended plan, Alternative 2, would result in minor, temporary, construction related adverse impacts to wildlife resources. The impacts to wildlife resources would be related to noise and visual disturbance during the construction activity. The impacts to fishery resources would be related to potential site runoff and increased turbidity, which could adversely impact feeding, spawning, and sheltering for species not accustomed to these conditions.

Alternative 1 – Repairs resulting from implementation of this alternative plan would result in similar impacts as described above due to borrow activity and construction associated with in-place repair.

Alternative 3 – The “No Action” Alternative would have minimal effects on fish and wildlife resources. These impacts would arise from flooding within the now unprotected area. Wetland species may benefit as more frequent flooding could occur in the now unprotected areas. Wetlands would likely recharge more often with a hydraulic connection to the Grand River,

which would benefit fish and wildlife. Other terrestrial organisms could be temporarily displaced or have their habitat degraded by flooding.

### **Threatened and Endangered Species**

Pallid sturgeon (*Scaphirhynchus albus*) are found primarily in the Missouri River and Mississippi River. No work is proposed within the Missouri River and therefore, no impacts to the pallid sturgeon are anticipated as a result of the proposed project. The Indiana bat (*Myotis sodalis*) roosts in trees with exfoliating bark that tend to be greater than 9 inches dbh during the spring and summer, and hibernates in caves during the fall and winter. Construction of the levee setback will impact about 40 trees >9" dbh, which includes pecan, oak, sycamore and silver maple. Trees impacted <9" dbh include cottonwoods and willows. These trees comprise a narrow, linear band of vegetation located adjacent to the existing levee and active agricultural activity. Approximately 2.5 acres of this vegetation was destroyed by the severe levee breach at station 91+03 to 96+03 in addition to acreages of similar habitat landside of the existing levee (Borrow Map 1 of 2). According to the USFWS Columbia, MO Ecological Field Services Office, the clearing of trees to facilitate the construction of the levee setback that meet the criteria for potential Indiana bat habitat would need to occur during their wintering period between October 1 and April 1. If tree clearing could not be conducted within this timeframe, CENWK would coordinate with the USFWS to determine the presence/absence of the Indiana bat prior to the initiation of tree clearing activities.

The removal of these trees to construct the levee setback does not appreciably change the character of the available Indiana bat summer habitat within the vicinity of the project area. There are contiguous tracts of similar tree species totaling >100 ac within the vicinity of the project area located along the Grand River to the west and south, and along the intermittent tributary of the Salt Creek located to the east of the levee setback. A large expanse of WRP land, measuring approximately 350 acres, is located south of the impacted vegetation.

Alternative 1 – Repairs resulting from implementation of this alternative plan would have no adverse effects on any Federally-listed threatened or endangered species or their habitat. The in-place repairs would require farmed wetlands and a small amount of WRP land to be impacted by borrow activities. This activity would require the removal of occasional willows and cottonwoods measuring < 9" dbh and filling in the levee breach, but would not likely impact potential Indiana bat roost trees.

Alternative 3 – The "No Action" alternative would have no adverse effects on the pallid sturgeon. The levee breach destroyed approximately 2.5 acres of potential Indiana bat roost habitat and additional vegetation. Without a federal action to repair the breach, additional existing habitat around the levee breach could be similarly adversely impacted due to a high water event. A levee breach would subject previously protected land to an increased of flooding, which could cause the mortality of existing trees and provide for new successional tree growth, which would eventually provide additional habitat for the Indiana bat.

### **Geologic Resources**

The recommended plan will require borrow material to repair the erosion and breached levee areas. Bedrock is located at least approximately 50 feet below the proposed excavation depth of

24". No impacts to geologic resources are anticipated as a result of borrowing or repairing the levee.

Alternative 1 – Bedrock is located at least approximately 50 feet below the proposed excavation depth of 24". No impacts to geologic resources are anticipated as a result of borrowing or repairing the levee under this alternative.

Alternative 3 – The "No Action" Alternative would have no effect on geologic resources.

### **Agricultural Activity**

The recommended plan, while restoring the pre-flood level of flood risk management, would protect about 3,500 acres of agricultural land from flooding. An adverse impact to agriculture results from the conversion of approximately 11 acres of agricultural land to riverward floodplain habitat due to the landward levee setback.

Alternative 1 – Repairs resulting from implementation of this alternative plan would have no impact on agricultural activity or loss of agricultural lands as in-place repairs would not result in a levee setback. Farmed wetlands and WRP would be impacted by borrow activity to facilitate the in-place repairs.

Alternative 3 – The "No Action" Alternative would adversely impact agricultural activity by exposing approximately 3,500 acres of agricultural lands (3,000 acres of croplands) to increased flooding. This loss of agricultural production would have related impacts such as lost income, lower tax base, and decreased land value.

### **Archeological and Historical Resources**

The recommended plan would have no impact to sites listed on or eligible for inclusion on the National Register of Historic Places (NRHP). A background check of the NRHP and site location maps identified one prehistoric archeological site (23CH322) that has been reported as potentially eligible for the NRHP recorded near the proposed project area. The site is believed to be a prehistoric camp site of Late Woodland age (AD 300-800). The site is mapped near a portion of the levee where no work or borrowing is planned. All project borrowing and work will avoid the recorded site location. Instructions to avoid the area will be included in project construction plans.

In a letter to SHPO, the Corps recommended that the project would have no effect on historic properties and that the project should be allowed to proceed. SHPO concurred with this recommendation on November 15, 2007 with the stipulation that project impacts avoid the previously recorded site (Appendix II). If in the unlikely event that archeological material is discovered during project construction, work in the area of discovery will cease, the discovery would be investigated by a qualified archeologist, and the find would be coordinated with SHPO and the Tribes.

Alternative 1 – Repairs resulting from implementation of the alternative plans would result in no effects to archaeological or historical resources.

Alternative 3 – The "No Action" Alternative would result in no effects to archaeological or historical resources.

### **Floodplain and Flood Risk Management**

The recommended plan would restore an approximately 10-year level of flood protection to the existing Garden of Eden Drainage District – Section 3 levee system, which would equal the level that existed prior to the declared flood event of 6 May 2007. The area is located in the base floodplain and is subject to Executive Order 11988, "Floodplain Management". In addition, since the proposed levee repair would restore this levee to its near original alignment and pre-flood grade and cross section, no increase in floodwater surface elevations would occur. As the recommended plan would not directly or indirectly support more development in the floodplain or encourage additional occupancy and/or modify of the base floodplain, the Corps has determined that the recommended plan complies with the intent of Executive Order 11988.

Alternative 1 – Repairs resulting from implementation of this alternative plan would result in similar flood protections as described above for the recommended plan.

Alternative 3 – The "No Action" Alternative would continue to expose all public and private infrastructure and agricultural croplands previously protected to a high level risk of future flooding.

### **Economics**

Based on the Corps' economic analysis, the recommended plan is economically justified with a benefit to cost ratio of 4.0.

Alternative 1 – Based on the Corps' economic analysis, repairs resulting from implementation of this alternative resulted in a lower benefit to cost ratio of 3.4.

Alternative 3 – The "No Action" Alternative has a zero benefit to cost ratio and would continue to expose all public and private infrastructure and agricultural croplands previously protected by the levee to a high level risk of future flooding. People's livelihood and social well-being would remain in turmoil, subject to the continuous threat of flooding until the level of flood protection is restored. Failure to reconstruct the levee could adversely affect the tax base of the counties and municipal governments and special districts, such as school districts. In addition, loss of jobs and potential losses in agricultural production on lands protected by the levee would also be incurred.

### **Esthetics**

The recommended plan would result in very minor and temporary adverse esthetic impacts associated with the construction activity. The setback would be located on privately owned agricultural land landward of the Grand River. The human population that could potentially be esthetically affected by the activity would be expected to be very low, restricted to the occasional boater on the Grand River or person(s) participating in outdoor recreation on private land within the project area. Upon completion of the project, the esthetic impact of the project would be basically the same as the original levee.

Alternative 1 – Repairs resulting from implementation of this alternative plan would result in impacts similar to those described above.

Alternative 3 – The “No Action” Alternative would have virtually no short-term effect on esthetics. Long-term opening of the breach would likely result in scouring adjacent land and altering the landscape.

## **Section 11: SUMMARY OF ENVIRONMENTAL EFFECTS OF THE NON-RECOMMENDED PLANS**

Alternative 1 would result in reduced impacts to farmed wetlands, WRP lands, and trees compared to the recommended plan, and no loss of agriculture producing land or the existing drainage ditch and adjacent trees > 9” dbh as the levee would be placed on its existing alignment and less borrow would be required for in-place repairs. Although Alternative 1 would allow for the enhancement of existing wetland acreage through borrow operations (approximately 10 acres), it would remove the opportunity for the blew hole to develop into a functioning wetland, and would not provide additional surface area to the river floodplain.

The “No Action” Alternative has not been recommended because it would not meet the project purpose and need of rehabilitating the damaged flood damage reduction project to its pre-flood condition and therefore restoring its associated social and economic benefits. The “No Action” alternative would have no permanent or temporary construction related impacts. The “No Action” alternative would continue to expose all public and private infrastructure, agricultural croplands and other vegetation within the area previously protected by the levee to a high level risk of future flooding. People’s livelihood and social well-being would remain in turmoil, subject to the continuous threat of flooding until the proposed level of flood protection is restored. Failure to reconstruct the levee could adversely affect the tax base of the county and municipal governments. In addition, loss of jobs and potential losses in agricultural production on lands protected by the levee would also be incurred.

## **Section 12: CUMULATIVE IMPACTS**

The combined incremental effects of human activity are referred to as cumulative impacts (40CFR 1508.7). While these incremental effects may be insignificant on their own, accumulated over time and from various sources, they can result in serious degradation to the environment. The cumulative impact analysis must consider past, present, and reasonably foreseeable actions in the study area. The analysis also must include consideration of actions outside of the Corps, to include other State and Federal agencies. As required by NEPA, the Corps has prepared the following assessment of cumulative impacts related to the alternatives being considered in this EA.

Historically, the Missouri River and its floodplain has been altered by bank stabilization, dams on the river and its tributaries, roads/bridges, agricultural and urban levees, channelization, farming, water withdrawal for human and agricultural use, urbanization and other human uses. These activities have substantially altered the terrestrial and aquatic ecosystem within the Missouri River watershed. The Corps, which administers Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act, has issued and will continue to evaluate permits authorizing the placement of fill material in the Waters of the United States and/or work

on, in, over or under a navigable water of the United States including the Missouri River and its tributaries.

These levee repair projects typically result in minor impacts to the aquatic ecosystem. The Corps, under the authority of the Public Law 84-99 Levee Rehabilitation and Inspection Program, has and will continue to provide rehabilitation assistance to Federal and non-Federal levee sponsors along the Missouri River which participate in the Public Law 84-99 Program. These projects typically result in minor, short-term construction related impacts to fish and wildlife and the habitats upon which they depend. Resources typically affected by this type of project generally include, but are not limited to, wetlands, floodplains, water quality, and fish and wildlife habitat. It should be noted that these projects do not result in an addition to flood heights or reduced floodplain area but are merely a form of maintenance to that which had previously existed.

Of the reasonably foreseeable projects and associated impacts that would be expected to occur, further urbanization of the floodplain will probably have the greatest impact on these resources in the future. The possibility of wetland conversion and the clearing of riparian habitat including tree species that are potential habitat for threatened and endangered species are ever present, and these activities tend to impact these resources. Construction of additional agricultural levees may occur provided land becomes available for this purpose; however, the trend seems to be moving in the opposite direction and towards urban development. The era of major reservoir construction has likely past, thus impacts from this type of project will not likely occur.

The adverse effects associated with the proposed project are long-term/minor associated with the loss of agricultural cropland, and short term/minor associated with project construction. These minor adverse effects would be greatly offset by restoring the flood risk management capability and its associated social and economic benefits of the existing levee system. The PL84-99 Program is designed to merely bring the damaged levees back to pre-existing conditions. Thus, no significant cumulative impacts associated with the proposed rehabilitation of the existing levee system have been identified.

### **Section 13: MITIGATION MEASURES**

The recommended plan will result in minor impacts to mitigable resources as defined in USACE Planning regulations and under Section 404 of the Clean Water Act. These impacts are associated with minor excavation of sand and silt material from within farmed wetland areas and minor excavation and fill from/in Natural Resource Conservation Service (NRCS) Wetland Reserve Program lands and an existing drainage ditch. General Permit Number NWKGP-41 authorizes these actions. In addition, the project sponsor will consult with the NRCS to obtain a Compatible Use Authorization agreement to ensure that borrow operations do not adversely impact the wetland or easement area. Approximately 40 trees within the WRP and drainage ditch areas consisting of cottonwoods, willows, silver maple, sycamore, oak, and pecan; less than and greater than 9 inches breast diameter height, will be removed during project construction. These tree species provide potential Indiana bat roost habitat. The clearing of trees to facilitate landward levee setback construction would preferably occur during the Indiana bat wintering period October 1 through April 1 to avoid impacts to this species. If the clearing of trees to

facilitate the levee setback could not be conducted during this timeframe, these trees would be surveyed for the presence/absence of the Indiana bat. CENWK in cooperation with the Missouri Department of Conservation and the U.S. Fish and Wildlife Service have determined that natural plant succession should provide adequate re-vegetation for non-mast producing trees. For the hardwood species, a sufficient seed base and stand of hardwood trees are present adjacent to the disturbed area to allow natural regeneration of these species. Approximately 2.5 acres of similar habitat was destroyed by the levee breach.

Although the removal of these trees to facilitate the construction of a landward levee setback is considered an adverse impact, the project as proposed provides many benefits to the aquatic ecosystem. The levee setback provides an additional 11 acres of land riverward of the levee that could develop into wetlands and/or timber that would provide additional viable floodplain habitat for fish and wildlife. The scour hole that has formed as a result of flooding would be left to become inundated and develop into a wetland or functioning riparian habitat. The excavation of sand and silt from farmed wetlands and WRP land down to a depth of approximately 24" will provide additional depth to facilitate inundation and the sloping of perimeter faces when borrowing is complete will improve the ability of these areas to capture runoff and increase wetland surface area. The benefits of the proposed project will enhance the values and functions of the aquatic ecosystem that will at a minimum, compensate for the adverse impacts associated with construction. Therefore, no compensatory mitigation is warranted or proposed.

#### **Section 14: COMPLIANCE WITH ENVIRONMENTAL QUALITY STATUTES**

Compliance with Designated Environmental Quality Statutes that have not been specifically addressed earlier in this report is covered in Table 1.

#### **Section 15: CONCLUSION & RECOMMENDATION**

The flood risk management level achieved by the recommended plan would return to the level of the pre-flood levees. The recommended plan would result in minor impacts to some mast producing trees and tree species that provide potential habitat for the Indiana bat. The recommended plan would result in no impacts to any properties listed, proposed for listing, eligible for listing, or potentially eligible for listing in the National Register of Historic Places. Areas of the existing levee sections damaged by flooding would be temporarily disturbed by the proposed construction activity.

The adverse effects associated with the proposed project are long term/minor associated with the loss of agricultural lands for the landward levee setback and short term/minor associated with project construction and the removal of some trees to facilitate construction. These minor adverse effects would be greatly offset by restoring the flood risk management capability and its associated social and economic benefits of the existing levee system. Alternative 2 – Landward levee setback with in-place repairs meets the project purpose and need of rehabilitating the flood damage reduction capability and its associated social and economic benefits of the existing levee system. Of the three alternatives considered, Alternative 2 – Landward levee setback with in-place repairs is recommended because it has the highest cost/benefit ratio, and is consistent with protection of the Nation's environment.

Based on coordination with the resource agencies and input gained through a public interest review, as documented in this Environmental Assessment, the Kansas City District – Corps of Engineers has made a preliminary determination that this project would have no significant impacts on the human environment including natural and cultural resources and Federally-listed threatened and endangered species; therefore, a Draft Finding of No Significant Impact (FONSI) has been prepared. This NEPA decision document will be forwarded to the District Engineer with a recommendation for approval.

#### **Section 16: PREPARERS**

This EA and the associated draft FONSI were prepared by Mr. Matthew D. Vandenberg (Environmental Resources Specialist), with relevant sections prepared by Mr. Timothy Meade (Historic and Archeological Resources). The address of the preparers is: U.S. Army Corps of Engineers, Kansas City, District; PM-RP, Room 843, 601 E. 12th St, Kansas City, MO 64106.

**Table 1**  
**Compliance of Preferred Alternative with Environmental Protection**  
**Statutes and Other Environmental Requirements**

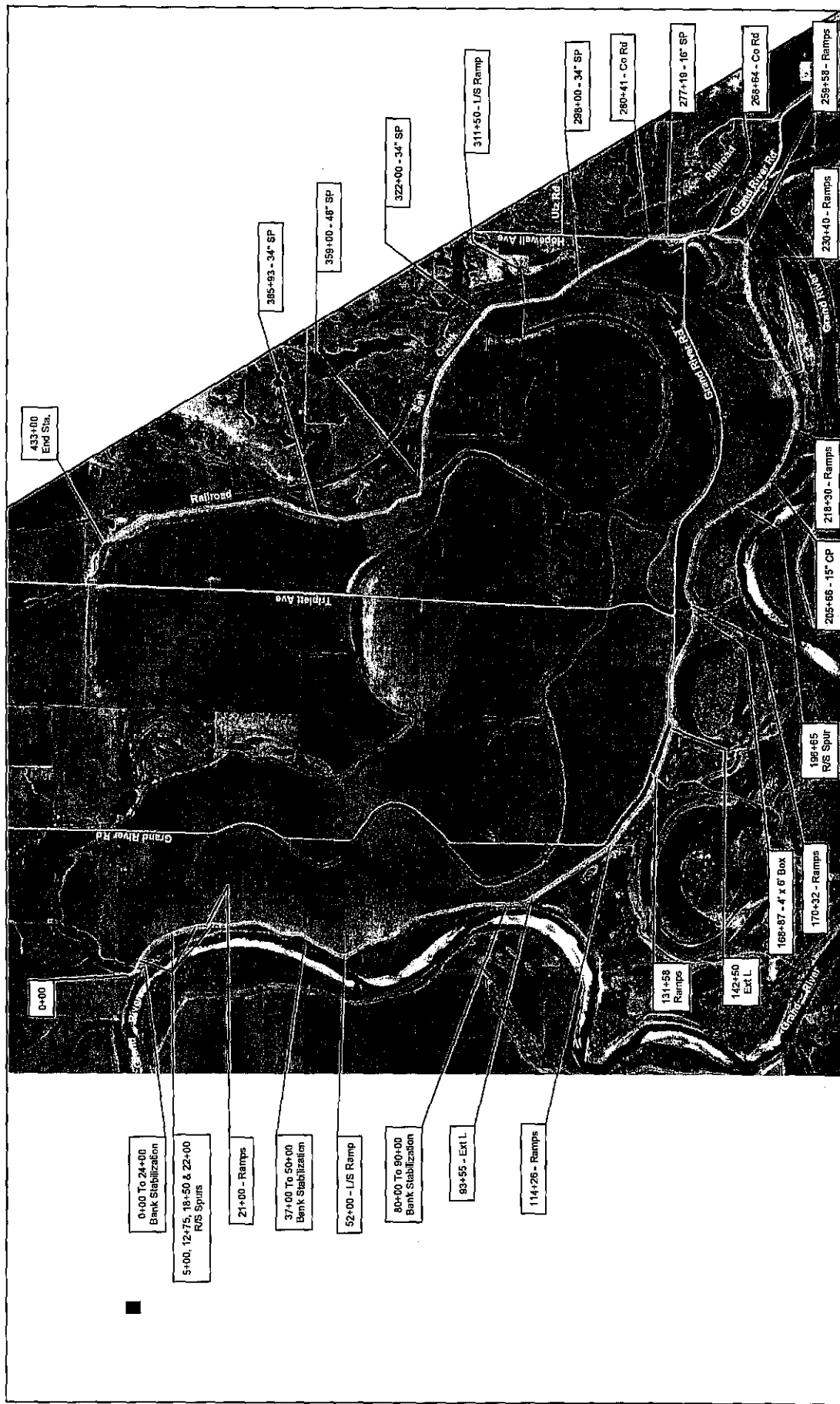
<b>Federal Policies</b>	<b>Compliance</b>
Archeological Resources Protection Act, 16 U.S.C. 470, et seq.	Full Compliance
Clean Air Act, as amended, 42 U.S. C. 7401-7671g, et seq.	Full Compliance
Clean Water Act (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq.	Full Compliance
Coastal Zone Management Act, 16 U.S.C. 1451, et seq.	Not Applicable
Endangered Species Act, 16 U.S.C. 1531, et seq.	Full Compliance
Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not Applicable
Federal Water Project Recreation Act, 16 U.S.C. 4601-12, et seq.	Full Compliance
Fish and Wildlife Coordination Act, 16 U.S.C. 661, et seq.	Full Compliance
Land and Water Conservation Fund Act, 16 U.S.C. 4601-4, et seq.	Not Applicable
Marine Protection Research and Sanctuary Act, 33 U.S.C. 1401, et seq.	Not Applicable
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Full Compliance
National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470a, et seq.	Full Compliance
Rivers and Harbors Act, 33 U.S.C. 403, et seq.	Full Compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Full Compliance
Wild and Scenic River Act, 16 U.S.C. 1271, et seq.	Not Applicable
Farmland Protection Policy Act, 7 U.S.C. 4201, et. seq.	Full Compliance
Protection & Enhancement of the Cultural Environment (Executive Order 11593)	Full Compliance
Floodplain Management (Executive Order 11988)	Full Compliance
Protection of Wetlands (Executive Order 11990)	Full Compliance
Environmental Justice (Executive Order 12898)	Full Compliance

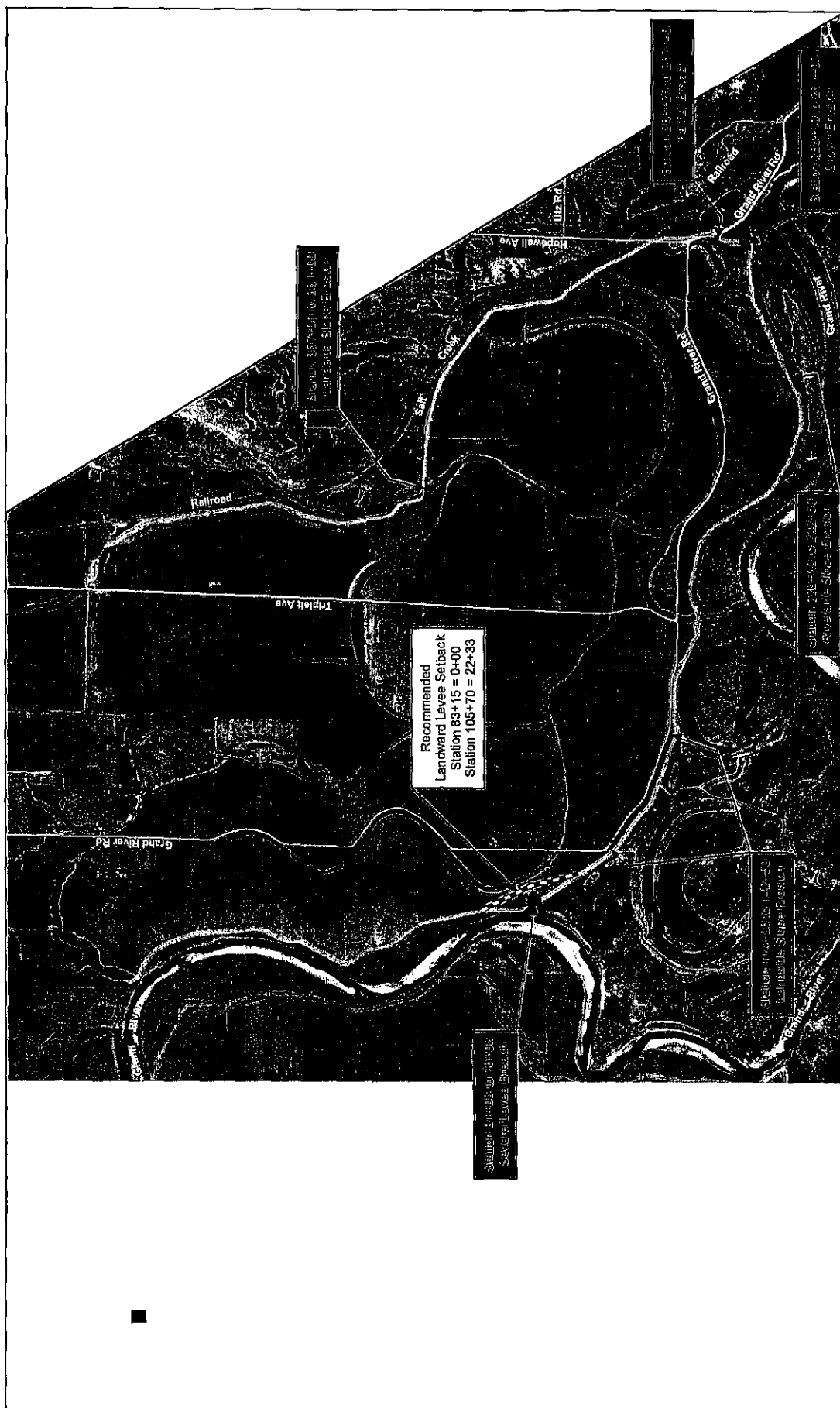
**NOTES:**

- a. Full compliance. Having met all requirements of the statute for the current stage of planning (either preauthorization or postauthorization).
- b. Partial compliance. Not having met some of the requirements that normally are met in the current stage of planning.
- c. Noncompliance. Violation of a requirement of the statute.
- d. Not applicable. No requirements for the statute required; compliance for the current stage of planning.

## **APPENDIX I – PROJECT MAPS**

*Garden of Eden Drainage District – Section 3 (Item 139S3)  
P.L. 84-99 Levee Rehabilitation Project  
Chariton County, Missouri  
March 2008*





Recommended  
Landward Levee Setback  
Station 83+15 = 0+00  
Station 105+70 = 22+33

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2022-2023

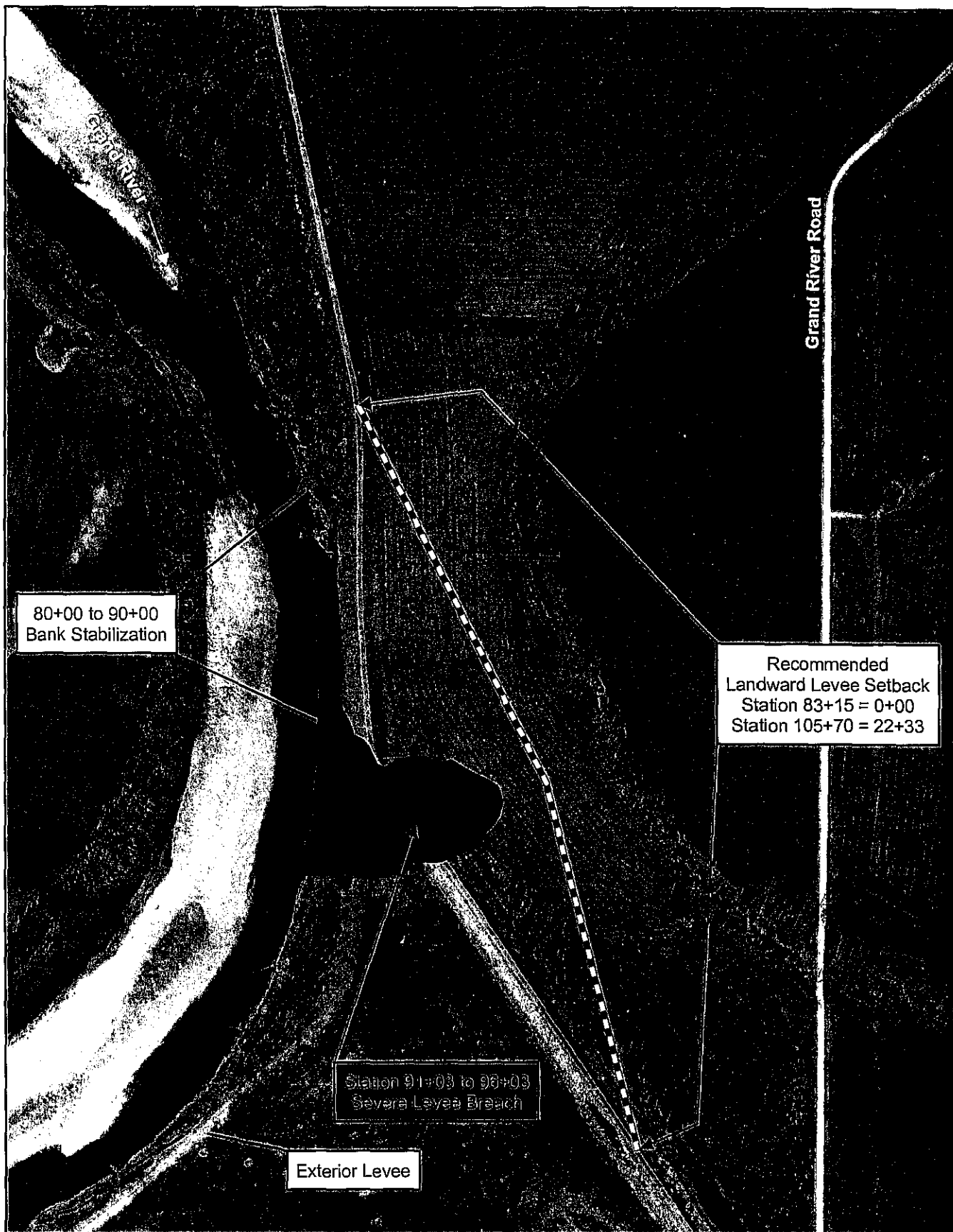
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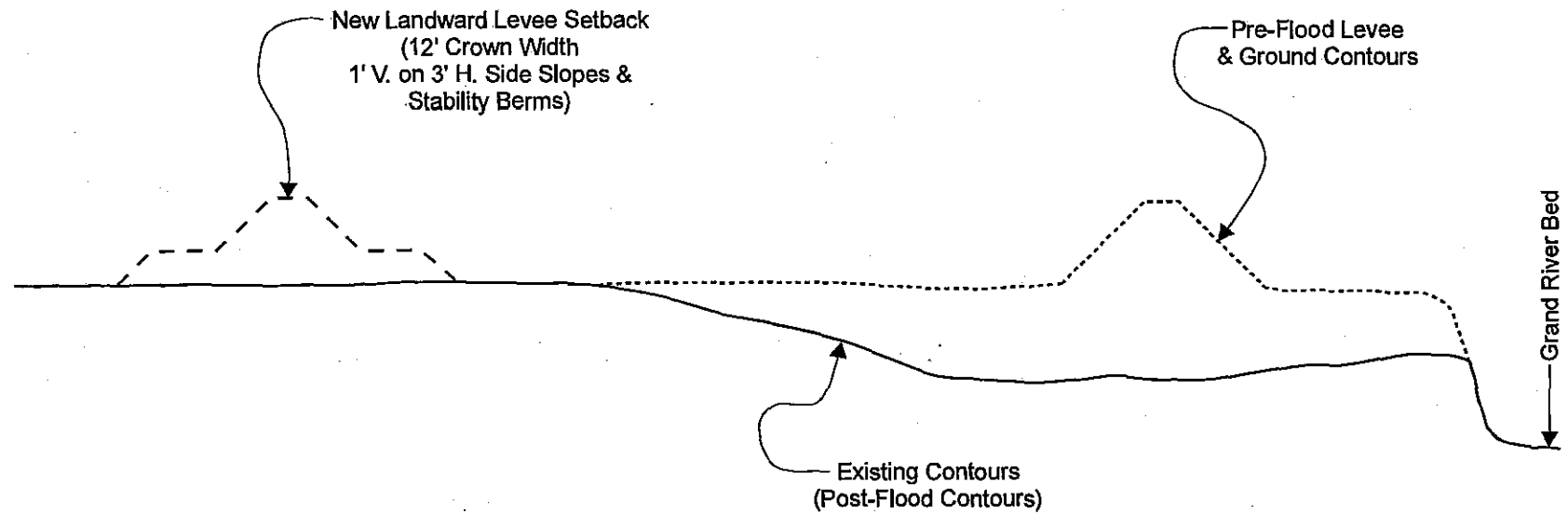
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9202140 2575-2116 281-0000

$$\frac{d}{dt} \left( \frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$$

**ATTACHMENT D - 1**



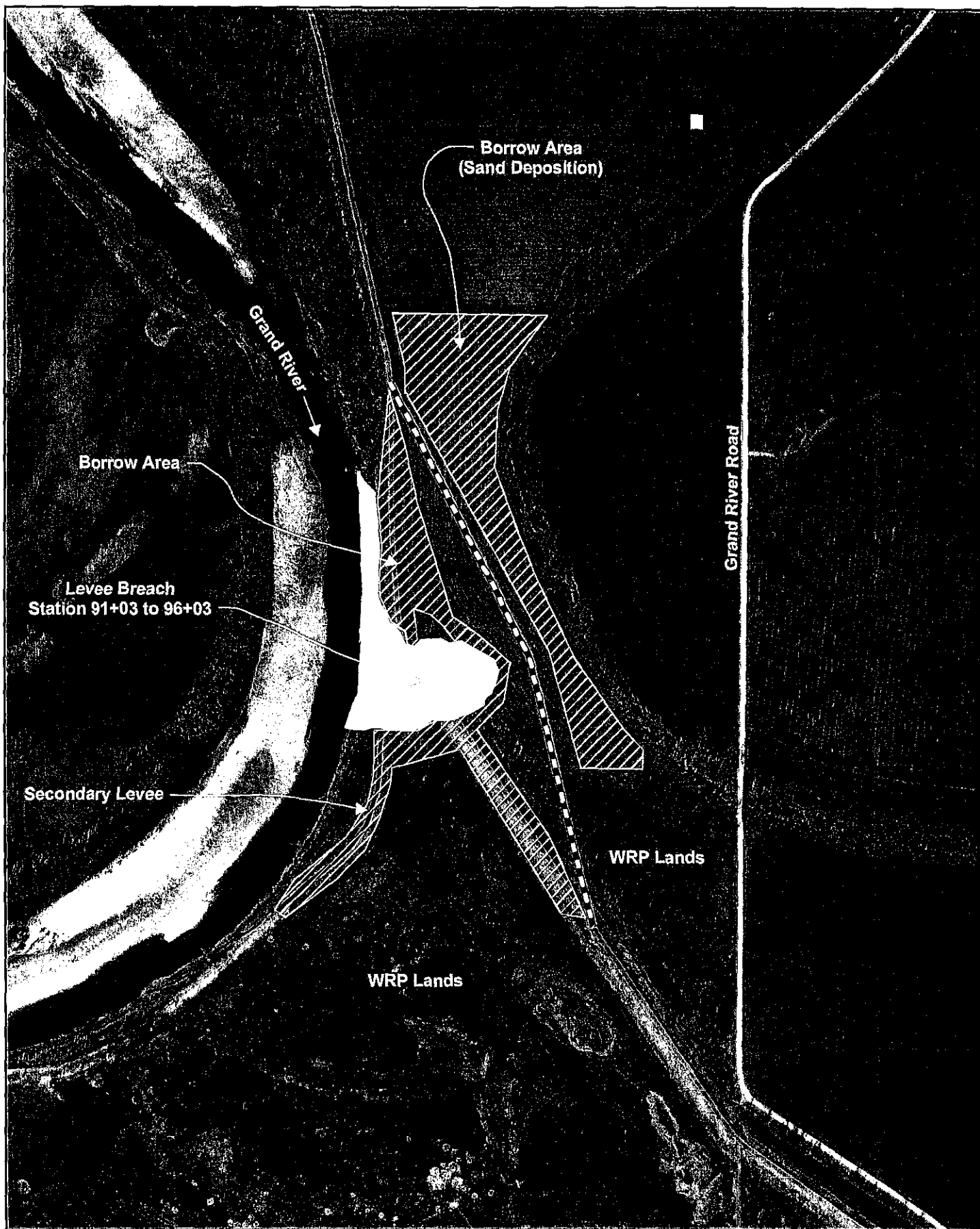


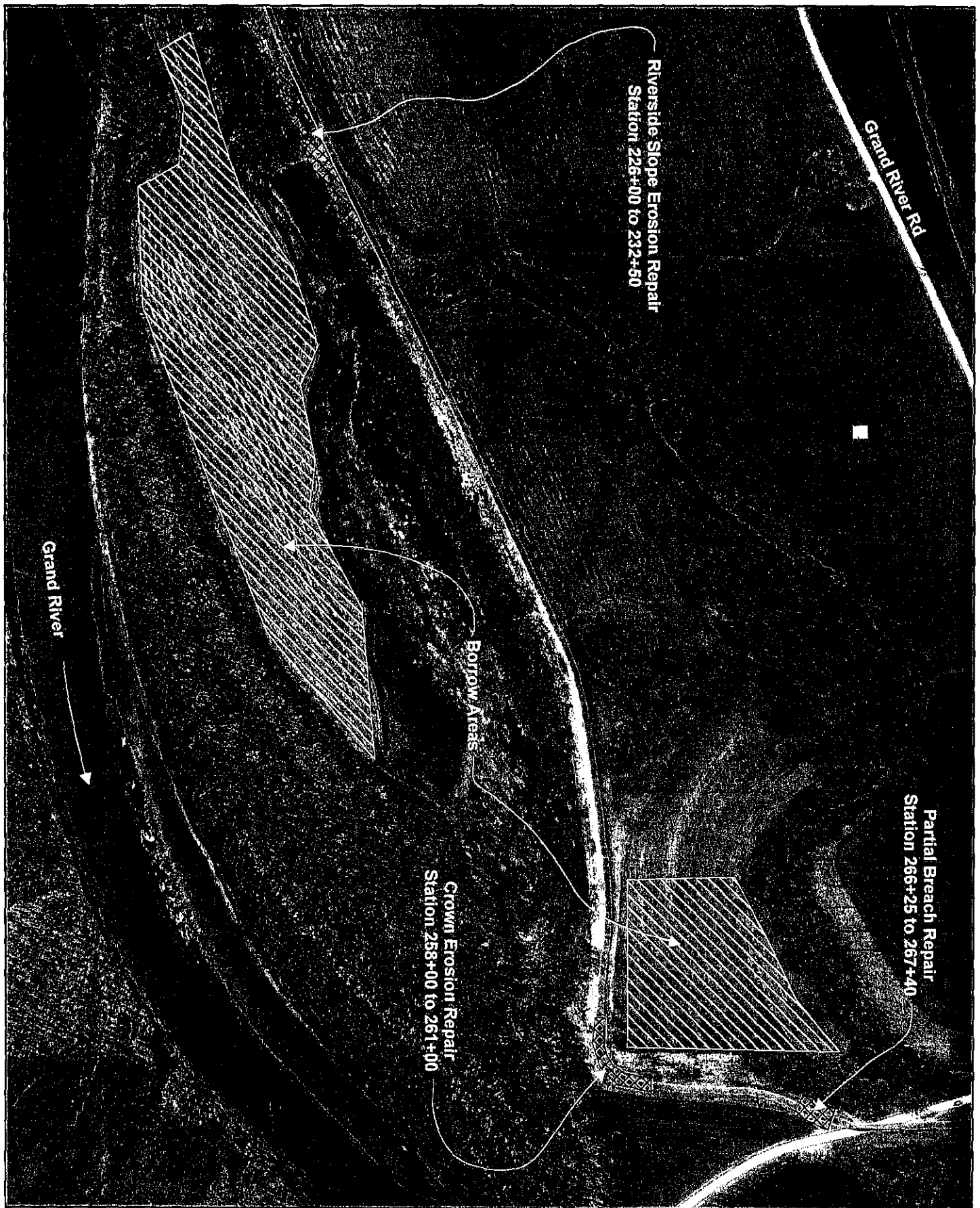
NOTE: Recommended repair is with landward levee setback.  
Station 83+15 = 0+00  
Station 105+70 = 22+33

**Typical Section**

Station 91+03 to 96+03  
Severe Levee Breach

Drawing Not To Scale





## **APPENDIX II – NEPA REVIEW**

*Garden of Eden Drainage District – Section 3 (Item 139S3)  
P.L. 84-99 Levee Rehabilitation Project  
Chariton County, Missouri  
March 2008*



Matt Blunt, Governor • Doyle Childers, Director

## DEPARTMENT OF NATURAL RESOURCES

[www.dnr.mo.gov](http://www.dnr.mo.gov)

November 26, 2007

Timothy Meade  
Corps of Engineers, Kansas City District  
700 Federal Building  
Kansas City, Missouri 64106-2896

Re: Emergency Repairs, Garden of Eden Levee Section 3 (COE) Chariton County, Missouri

Dear Mr. Meade:

Thank you for submitting information on the above referenced project for our review pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which requires identification and evaluation of cultural resources.

We have reviewed the information provided concerning emergency repairs to the Garden of Eden Levee Section 3. Based on this review we concur with your recommendation that that the project is in areas of low potential as recently accreted land, or areas of previous disturbance and that there will be **no historic properties affected**, with the condition that construction and borrowing activities will avoid previously recorded site 23CH322, which is to be avoided by project activities. We have no objection to the initiation of project activities.

Please be advised that, should project plans change, information documenting the revisions should be submitted to this office for further review. In the event that cultural materials are encountered during project activities, all construction should be halted, and this office notified as soon as possible in order to determine the appropriate course of action.

If you have any questions, please write Judith Deel at State Historic Preservation Office, P.O. Box 176, Jefferson City, Missouri 65102 or call 573/751-7862. Please be sure to include the SHPO Log Number (003-CH-08) on all future correspondence or inquiries relating to this project.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

A handwritten signature in black ink, reading "Mark A. Miles".

Mark A. Miles  
Director and Deputy  
State Historic Preservation Officer

MAM:jd